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ABSTRACTS

FIBERS A

The quality index of fibers.

H. Böhringer. *Z. ges. Textil-Ind. 57, No. 1:* 11-15 (1955); *in German.* Through *Brit. Cotton Ind. Research Assoc. 35:* 218 (1955).

The fibers are divided into three groups, (1) natural, (2) regenerated, and (3) synthetic, and their characteristic properties are discussed and tabulated. The fibers are arranged in the order of their quality index, which is based on the highest values obtained for tensile strength, specific elastic tearing strength, relative loop strength, relative wet-strength, and specific volume, the ideal fiber having the quality index of 100.

NATURAL FIBERS A 1

How cotton reacts to temperature.

B. K. Power, J. D. Towery and L. E. Hessler (Texas Technological College). *Cotton Gin and Oil Mill Press 56:* 12-14,55 (April 9, 1955).

Throughout the harvesting season the amount of moisture in the open boll of cotton varies with the temperature and relative humidity. This study was made to determine some of the moisture relationships existing in cotton in the field at the time of harvest.

Cotton counts its customers.

National Cotton Council of America. Memphis, Tenn., 1955. 31 p.

Statistics on the quantity of cotton consumed in final uses in the United States, revised 1953 and preliminary 1954.

Effect of maturity on the dimensions of ultimate fibers of jute.

N. S. Rao and B. C. Kundu (Jute Agricultural Research Institute). *J. Sci. and Ind. Research (India) 14B:* 124-127 (March, 1955).

Fiber dimensions like length, breadth, lumen size and thickness of the wall were studied in jute in six different progressive stages of maturity from prebud to dry capsule stage. Harvesting at the bud stage yields the best quality fiber. 12 references.

The fiber cores of steel wire ropes.

A. E. Williams. *Fibres 16:* 117-120 (April, 1955).

Manila, sisal or jute are the three most popular fibers used for the cores of wire ropes. Without these fiber cores such ropes would lose much of their flexibility and internal lubrication. This article describes the function of the core, the various grades of fibers used for the purpose and their treatment before being incorporated into the wire rope.

Soft fiber prospects in the South Pacific.

Fibres 16: 121-123 (April, 1955).

An account of a survey of soft fiber resources in the South Pacific region.

Note on the effect of nonuniformity of the cross-sectional area upon the tensile behavior of wool fibers.

E. C. Banky and S. B. Slen (Experimental Station, Lethbridge, Alberta). *(Letter to the editor). Textile Research J. 25:* 358-361 (April, 1955).

12 references.

Amino acid composition of normal wools, wool fractions, mohair, feather, and feather fractions.

W. H. Ward, C. H. Binkley and N. S. Snell (Western Utilization Research Branch, Agriculture Research Service). *Textile Research J. 25:* 314-325 (April, 1955).

Amino acid contents of some normal wools are reported. The amino acid composition of mohair was found in most respects similar to that of wool. The sample analyzed was appreciably lower in sulfur and tyrosine. Feather was found to differ from wool most interestingly in having lower contents of sulfur and cystine and higher contents of glycine, proline, and serine. These features have been proposed to contribute to the relative ease of solution of feather keratin. 41 references.

Amino acid compositions of several wool fractions as determined by paper chromatography.

R. L. Golden, J. C. Whitwell and E. H. Mercer (Textile Research Institute). *Textile Research J. 25:* 334-342 (April, 1955).

19 references.

MAN-MADE FIBERS A 2

Fiber nomenclature.

DuPont Tech. Bull. 11: 33-36 (March, 1955).

DuPont nomenclature list designating the fibers and types now in use. Conversion nomographs for measuring yarn cross sections and strength and modulus units accompany the fiber listings.

A history of the development of certain man-made fibers used by the family and a comparison of selected characteristics of these fibers.

Sister R. Joseph. Master's thesis, Drexel Institute of Technology, Philadelphia, Pennsylvania, 1954.

Data concerning synthetic fibers. Part 2. Nylon.

P. S. Nagar. *Brit. Rayon and Silk J. 31:* 68-72 (April, 1955).

PAN and Dralon: acrylic fibers from West Germany.

Fibres 16: 134-136 (April, 1955).

The development, properties, and uses of these new acrylic fibers are briefly discussed.

Processing Terylene textiles.

Dyer 113: 539-541 (April 1, 1955).

The characteristics of polyester fibers in weaving, dyeing, and finishing are discussed. Some industrial end-uses are given.

Skin and core of viscose yarn.

J. F. Briggs. *(Letter to the editor). J. Textile Inst. 46:* T230-T231 (March, 1955)

YARN PRODUCTION B

Report of discussions of questions on carding, spinning and warp preparation.

Textile Operating Executives of Georgia. Atlanta, Ga., 1955. 21 p.

Straggling nylon problems.

Am. Textile Reptr. 69: 49,77-78 (April 14, 1955).

Proper care of the Pacific converter, correct drafting pressures, and use of high temperature dyeing can handle miscut, undrawn nylon fibers.

OPENING, PICKING, FIBER PREPARATION B 1

New hopper bale opener.

P. Kohler. *Z. ges. Textil-Ind. 57, No. 2:* 104 (1955); *in German.* Through *Brit. Cotton Ind. Research Assoc. 35:* 202 (1955).

The main characteristics of the new opener comprise a filling tank divided into two successive mixing compartments, and a combination of feed lattices traveling at various speeds, by means of which the material is fed into the hopper and any unopened material continuously re-fed into the filling tank.

An aerodynamical study of the opening and cleaning of cotton by existing machinery.

W. Bostock, S. M. Freeman, S. A. Shorter and T. C. Williams (Brit. Cotton Ind. Research Assoc.). *J. Textile Inst. 46:* T171-T190 (March, 1955).

This paper was first circulated privately by the Shirley Institute in 1937. It is now published with only minor alterations and contains no reference to work done since that date. The authors describe a study of the action of existing opening machinery by a method that is fundamental in scientific research into the opening and cleaning of cotton. For the efficient opening of cotton, the compressed material from the bale requires to be broken into small portions and loosened as much as possible with the minimum amount of mechanical treatment. An experimental method is described by which to assess the extent of this breaking and loosening.

Tow opening machine.

S. Watanabe (Tokyo University). *J. Textile Machinery Soc. Japan 1:* 55-57 (March, 1955).

This article deals with two tow-opening machines (for man-made fibers) designed by the author. One opens by vibration and the other by air jet. Diagrams. Photographs. Table.

Pressed felt manufacture. Part 1. Blending.

K. E. Foulds. *Textile Mfr. 81:* 183-184 (April, 1955).

In felt manufacture it is essential to know the specific use of the finished material as this decides the blend, processing technique, and other important factors.

CARDING AND COMBING B 2

A method of reducing card waste.

H. M. Brown, J. L. Thompson and J. S. Gra-

ham (Clemson Textile School). *Bobbin and Beaker 13:* 10-13 (Summer, 1955).

A progress report on a card study in which the flats were run in reverse and in two sections —a short section at the rear running at a relatively high rate and the other main section running very slowly.

Speeds and settings of jute mill cards.

N. T. H. deMonte (Nudea Jute Mills Co. Ltd., West Bengal, India). *Textile Mfr. 81:* 163-165,172 (April, 1955).

The author describes the development of a new formula to express the percentage carding work performed, followed by an analysis and discussion with some typical values for jute mills.

Studies on automatic card stripper.

Y. Niitsu, S. Suzuki and A. Yoshikawa (Osaka University). *J. Textile Machinery Soc. Japan 1:* 39-42 (March, 1955).

Construction of automatic card stripper, theoretical analyses of the characteristics of cylinder strips and sliver output in the carding process, and remarks on the design and the effects of the automatic card stripper. Graphs, tables, diagrams, and photographs.

Studies on the relation between the angle of the card wire and the carding action.

K. Mizukaga (Toho Rayon Co. Ltd.). *J. Textile Machinery Soc. Japan 1:* 52-54 (March, 1955).

Comber preparation.

W. A. Thomason, Jr. *Textile World 105:* 120-121, 196-198 (May, 1955).

A Southern combed-yarn mill reduced comber noil 2% and improved yarn evenness and appearance with new comber preparation. As a result of further tests, it is going to replace all sliver lappers and ribbon lappers with preparatory drawing and lap winders.

DRAWING AND ROVING B 3

Correcting worsted sliver weight automatically with the Raper autoleveller.

Prince-Smith and Stells, Ltd. *Textile Ind. 119:* 112-113 (May, 1955).

A brief summary of how the autoleveller works and applications in U. S. mills. Diagram. Photographs.

Single spindle capbarless draft system.

J. Textile Machinery Soc. Japan 1: 64-67 (March, 1955).

A number of Japanese drafting systems are described briefly. Diagrams. Photographs.

Studies on the gripping of drafted sliver by the top roller of the spinning frame.

K. Shirakashi, M. Yamaguchi and I. Toyoshima (Tokyo Institute of Technology). *J. Textile Machinery Soc. Japan 1:* 30-36 (March, 1955).

Data are given on studies of how the hardness, elastic properties, and surface conditions of leather-covered and gum-covered top rolls, as well as the thickness of the bundle of fibers, affects the gripping of slivers and the drafting operations.

SPINNING, WINDING, TWISTING B 4

Ends down in spinning.

J. Delaney (Joanna Cotton Mills). *Textile World 105:* 95-96 (May, 1955).

Keeping spinning ends down under control requires a lot of trouble shooting. Joanna Cotton Mills works toward good spinning by keeping a check on: humidity, rings, top rolls, spindles, travelers, and break drafts.

Measuring of air drag of the yarn on ballooning.

M. Yamaguchi (Tokyo Institute of Technology). *J. Textile Machinery Soc. Japan 1:* 36-38 (March, 1955).

The air drag of the yarn on ballooning is theoretically assumed to be in proportion to the spinning speed or its square. The author has carried out measurements and developed a formula which involves more factors than have heretofore been considered.

The optimum number of spindles per operative.

R. Neumann. *Textil-Praxis 9, No. 12:* 1131-1132 (1954); *in German.* Through *Brit. Cotton Ind. Research Assoc. 35:* 240 (1955).

The work of a spinner and the time required for the individual operations are specified and equations which are based on time and motion studies are given, by means of which the optimum number of spindles per worker can be calculated. From the equations it is seen that the number of spindles is directly proportional to the yarn count and inversely proportional to the yarn velocity and the number of breakages.

The Partington slubbing attachment.

E. Dyson and W. Parkin (Bradford Technical College). *Textile Merc. 132:* 645-646 (April 15, 1955).

The Partington slubbing attachment is designed in the form of an auxiliary device which can be fitted to an ordinary spinning frame so as to produce a singles slub yarn having a slub pattern, the length of which is so great that it can be taken to be a random pattern.

Rings and travelers.

H. Hofmann. *Melliand Textilber. 35, No. 12:* 1328-1330 (1954); *in German.* Through *Brit. Cotton Ind. Research Assoc. 35:* 202 (1955).

Types of rings and travelers are reviewed and it is pointed out that, by a correct choice and careful treatment of these expensive parts of the spinning machine, costs can be reduced and the quality of yarn improved (fewer breakages). Causes of the faults are discussed and preventive measures suggested.

Rough-finished ring for spinning frames: a unique product in Japan.

J. Textile Machinery Soc. Japan 1: 68-69 (March, 1955).

Advantages of the so-called rough-finished rings which are made by either chemical or electrolytic grinding. Photomicrographs compare the surfaces of smooth-finished and rough-finished rings.

Spinning tension on ring frames.

T. Ogawa, Y. Urano and H. Yokota (Kanegabuchi Spinning Co.). *J. Textile Machinery Soc. Japan 1:* 17-23 (March, 1955).

Using the General Electric Tensometer, a study was made of the yarn tension and the factors causing yarn tension during the winding of yarn on the bobbin. The temperature and humidity have a big effect on the tension and there are many points which are not according to theory. Measurements with the ring separator showed that the yarn tension is influenced greatly by the lift if the yarn is spun on a high-lift spinning frame with double ring separators. Finally, the double ring spinning frame has been studied and found to have the least variation in yarn tension and a minimum of ends down.

End breakages in worsted spinning. Part 2.

P. P. Townend and L. T. Yu. *Textile Recorder 72:* 76-77 (April, 1955).

The condition of the roving used in the experiment is described.

Features and adaptability of the woolen ringframe. Part 3.

J. A. B. Mitchell (Scottish Woolen Technical College, Galashiels). *Textile Mfr. 81:* 170-172 (April, 1955).

Methods of specifying draft in mule and ring spinning are compared. Draft rollers are also discussed.

Woolen ring frame spinning. Part 4.

P. P. Townend and B. Jowett. *Wool Rev. 27:* 39 (April, 1955).

Experiments were carried out to ascertain the disposition of twist between the top of the false twister tube and the nip of the delivery rollers.

YARNS B 5

Influence of twist on textile yarns. Part 1.

A. Webster. *Textile Mfr. 81:* 176-177 (April, 1955).

The prospects of making small amounts of two-fold twist yarns by repeated over-end winding are examined, also the effect of over-end twist on regular mixture yarns, and over-end twist on parallel wound mixture yarns in knitted fabrics.

Strength of yarns produced at varying rates of production in the woolen card.

L. Mackereth (Dewsbury and Batley Technical and Art College). *(Letter to the editor). J. Textile Inst. 46:* T225-T226 (March, 1955).

Woolen and worsted yarn manufacture.

Wool Record 87: 804-806 (April 7, 1955).

Novel twist effects.

Specialty acetate yarns. Part 1.

J. Willock and H. M. Averns (Courtaulds Ltd). *Brit. Rayon and Silk J. 31:* 64-67 (April, 1955).

A general description of production principles and the character of the different types of yarn. Photographs.

FABRIC PRODUCTION C

Braiding and core-covering machines.

B. & F. Carter & Co. Ltd. *Skinner's Silk and Rayon Record 28:* 1264-1267 (December, 1954).

A number of braiding machines are described and illustrated.

WARPING, SLASHING, YARN PREPARATION C 1

Direct-driven beamer.

Crowther Ltd. *Textile Wkly. 55:* 1135-1136 (April 15, 1955).

This type D beaming headstock has been designed to provide a simple and efficient tool for direct beaming which could be operated at high speeds and minimum cost, free from interruptions, and with practically no maintenance.

A new sizing machine (Ruti) for small and medium plants.

H. Jagler. *Z. ges. Textil-Ind. 57, No. 2:* 107-109 (1955); *in German.* Through *Brit.*

Cotton Ind. Research Assoc. 35: 204 (1955).

The new machine, described and illustrated, takes up very little space, has a simple construction, and is easily operated. By turning the screw spindles, the beam pivot bearings can be displaced laterally to equalize all the warp rollers and to ensure parallel running of the threads into the sizing trough. The dipping depth of the rollers can be regulated, and an adjustable overflow ensures a constant size level in the trough. Other control devices are described. The desired warp length can be marked off by means of an electrically controlled apparatus.

Size mixing factors: choice and application.

Textile Mfr. 81: 192-196 (April, 1955).

8 references.

WEAVING C 2

The elimination of starting places.

R. Acker. *Skinner's Silk and Rayon Record 28, No. 12:* 1278-1279 (1954). Through *Brit. Cotton Ind. Research Assoc. 35:* 205 (1955).

A German firm has produced a low-power microscope for attachment to looms which enables the cloth fell to be accurately positioned after long stoppages or pickfinding.

An investigation of shuttle change motion on automatic looms.

M. Kimura and Y. Matsumoto (Howa Machinery Ltd). *J. Textile Machinery Soc. Japan 1:* 24-29 (March, 1955).

This article reports results of investigations into the weft yarn replenishing motion in a shuttle change automatic loom. Data were gathered during actual operation, in respect to such problems as the dynamic load of shuttle changing, the bottom surface stress of the supplying shuttle, and distribution of the stopping positions of the exhaust shuttle in the shuttle box, and the time required for complete closure of the snap guard. Diagrams.

Measurements of weaving processes (Messungen von Vorgangen am Webstuhl).

Wirtschaft- und Verkehrsministeriums, Nordrhein-Westfalen. Publication No. 92. Published in manuscript form by Westdeutscher Verlag GmbH, Cologne and Opladen, 1954. 64 p. Price: DM. 15.50. *In German.* Summary in *Skinner's Silk and Rayon Record 29:* 268-269 (March, 1955).

Recording yarn tension meters using electronic amplifying equipment in conjunction with one of the newly developed high speed pen recorders, and an electronically triggered light flash of extremely short duration used with a photographic camera were used in this detailed loom study. While in no way exhaustive, the report gives a large number of results of experiments on a limited number of looms. The three aspects of the loom selected for attention are warp tension, weft tension, and shuttle flight. All the results were obtained with cotton and linen yarns.

Mechanics of dobby shedding. Part 2.

J. Starkie. *Textile Mfr. 81:* 189-191 (April, 1955).

Continuing a discussion of dobby mechanism, this article deals with cross-border dobbies and the method of operation, spring reversing motions for dobby shedding and cam dobbies utilizing an endless paper roll instead of lags. Diagrams.

Misplaced ends in cloth.

W. C. Westbrook. *Textile World 105:* 110-111 (May, 1955).

Misplaced ends are made up of seven distinct defects, and each defect has its own cause. By checking the specific defect, the cure can be found: misdraws, doubles, missing warp ends, mixed yarn, misplaced filling yarn, harness balks, and mixed filling yarn.

New methods of weft insertion.

D. Brunnschweiler. *Skinner's Silk and Rayon Record 29:* 378-381 (April, 1955).

Descriptions are given of two new methods of weft insertion, one German and one Czechoslovakian, fitted to two revolutionary looms, the Neumann Gripper Shuttle Loom made by VEB Webstuhlbau and the Czechoslovakian Svaty loom, both shown at the 1954 Leipzig Fair. As far as is known, neither of the looms shown were production models, but rather experimental prototypes, and it remains to be seen whether the methods meet with industrial success. This article has been translated and condensed from an original account in German by D. Schachoff, in *Textil- und Faserstofftechnik, 5, No. 1:* 15-22 (1955). 10 diagrams.

A new shuttle-changing loom.

Henry Livesey Ltd. *Textile Merc. 132:* 675-676 (April 22, 1955).

A new non-stop fully automatic rayon loom in which the automatic shuttle-changing arrangements have the battery of twelve shuttles fitted as a complete unit to the loom. Operation of the shuttle change mechanism is effected from an electric distance feeler motion of new design.

New Swiss automatic loom.

Benninger Engineering Co. *Textile Merc. 132:* 537-538 (April 1, 1955).

Four-color pirn changing automatic loom for weaving fine filament synthetic yarns.

New terry and circular looms.

Skinner's Silk and Rayon Record 28; 1270 (December, 1954).

Some German and Austrian looms are briefly described.

Positive taking-up motion regulators on looms.

E. Meyer and W. Swatek. *Z. ges. Textil-Ind. 57, No. 2:* 109-110 (1955); *in German.* Through *Brit. Cotton Ind. Research Assoc. 35:* 205 (1955).

The positive taking-up motion regulators described comprise wheel regulators with 6 or 3 ratchet traps, and a positive pinion regulator for the Astra loom.

The preparation and weaving of man-made fibers and blended yarns.

G. Turton and K. Greenwood. *Textile Wkly. 55:* 1190-1194 (April 22, 1955).

A general review.

Shedding mechanism.

A. T. C. Robinson. *Skinner's Silk and Rayon Record 29:* 390-393 (April, 1955).

The principles of shedding in relation to the passage of the shuttle (*Skinner's Silk and Rayon Record 28:* 160-162 (February, 1954), and the design of shedding tappets (*ibid.*, 309-311 (March, 1954)) have previously been outlined, but only the simplest type of shedding motion, the inside tappet motion found on plain Lancashire looms, was described. The author now goes on to discuss other types of shedding motion. Diagrams.

Shuttle braking.

R. Kruger. *Textil-Praxis 9, No. 12:* 1143-1148 (1954); *in German.* Through *Brit. Cotton Ind. Research Assoc. 35:* 205 (1955).

Equations for calculating the braking force acting on the shuttle and its loss of kinetic energy and velocity are given, and factors to be considered in the construction of suitable braking mechanisms are discussed.

Weavability graphs.

D. Brunnschweiler (Univ. of Manchester). *(Letter to the editor). Textile Research J. 25:* 361 (April, 1955).

4 references.

Weaving defects. Part 1.

C. O. Cronic. *Textile Ind. 119:* 100-101 (May, 1955).

41 causes of kinky filling are listed and identified on loom photographs. This series should be especially helpful to mills equipped with looms of models Modified D, XD, X2, E, and L.

Methods for the presentation of a weave diagram and plans for drafting, denting and lifting.

J. Textile Inst. 46: S1-S5 (March, 1955).

Tentative textile standard No. 27, 1955.

KNITTING C 3

A contrivance for sealing yarn beams on warp knitting frames.

A. A. J. Kramers. *Enka Breda Rayon Rev. (English ed.) 9:* 28-31 (March, 1955).

The device described in this article enables yarn beams not fully unwound to be removed from the knitting machine with the yarn arranged exactly as delivered by the warping creel.

Knitted outerwear technology.

C. Reichman. *Modern Textiles Mag. 36:* 77-81 (May, 1955).

A report on new developments.

Knitting of lace nets and curtain fabrics.

J. B. Lancashire. *Textile Recorder 72:* 70-72 (April, 1955).

Crocheting and raschel machinery.

Raschel nets.

J. E. Raybin. *Textile World 105:* 119, 192-196 (May, 1955).

Suggestions are given for better production of raschel nets, including grinding links to give smooth knitting, setting swing cam with small motion, and setting needle heads low in guide hole.

Weft knitted plush fabrics.

J. Rab. *Skinner's Silk and Rayon Record 29:* 398-400 (April, 1955).

Machines for knitting weft-knitted plush fabrics, also known as pile, loop, or terry fabric, are described and their workings explained.

FABRICS C 4

Air permeability of parachute cloths.

M. J. Goglia, H. W. S. LaVier and C. D. Brown. *Textile Research J. 25:* 296-313 (April, 1955).

This study is concerned with the determination of the air permeability of nylon-type fabrics used in the manufacture of parachutes. The scope of the project included the experimental determina-

tion of the air permeability of the various fabrics under conditions of pressure differentials across the cloth up to 50 in. of water. 74 references.

Dr. Kroners textile fabric album (Dr. Kroners Textil-Stoffalbum).

K. Kroner, Verlag, Stuttgart. Price of set of six complete albums, DM 66.00, albums and yarn cloth samples available separately. *In German.* Through *Skinner's Silk and Rayon Record 29:* 393 (April, 1955).

A new series of fabric and yarn sample collections has recently been published in Germany. The six volumes cover raw materials, basic cloths, women's wear fabrics, men's wear fabrics, household and knitted fabrics, and ornamental textile effects and trimmings, and the complete collection includes about 250 samples. The first volume covers the spinning operations, dealing with seven different spinning systems, for each of which eight samples of the state of the material at different stages of production are given, the samples being contained in transparent envelopes. The remaining volumes give samples of cloth mounted in an analogous manner to postage stamps in a collection. Underneath each cloth sample is printed the weave, while below is a table of weaving particulars and the purpose for which the cloth was intended. The publishers make the volume available either complete with samples, or, for technical school students' use, provide the empty albums, and then supply the samples for the students to analyze and fill in their own weaves and other particulars. Each album may be supplied separately.

Faults in woolen manufacturing. Part 3.

Textile Recorder 72: 67-69 (April, 1955).

Finished fabric faults originating in fiber preparation and spinning.

Mechanical electrostatic charging of fabrics for air filters.

L. Silverman, E. W. Conners, Jr. and D. M. Anderson (Harvard School of Public Health). *Ind. Eng. Chem. 47:* 952-960 (May, 1955).

Test results are presented in which a mechanically induced electrostatic charge on certain fabrics is employed as an aid in the removal of atmospheric dust from air at room temperature. The theory of mechanically induced static charges and some experimental data are presented. A so-called tribo-electric series of common fibers is developed. The electrostatic mechanism of aerosol filtration for the three most important precipitating forces is described. 29 references.

Non-woven fabrics.

L. Cerini. *Tinctoria 51, No. 11:* 406-408 (1954); *in Italian.* Through *Brit. Cotton Ind. Research Assoc. 35:* 214 (1955).

The historical development of the process for impregnating compressed fibrous material with rubber emulsions, other polymers or colloids to produce leather imitations and other non-woven fabrics is reviewed, and particular reference is made to the Italian product Peplon, a non-woven fabric in which the fibrous element is predominant and to which can be imparted a soft feel as in cotton, a slightly rough feel like that of wool, a scroop like that of silk, or the characteristics of leather and chamois.

Nylon bonded spindle tapes.

William Kenyon and Sons Ltd. *Fibres 16:* 126 (April, 1955).

The manufacture and uses of these tapes are briefly described.

Serviceability of sheets composed wholly or in part of cotton and viscose staple rayon.

V. I. McLendon and S. Davison. Wash., U. S. Dept. of Agriculture, Jan. 1955. 57 p. Technical Bull. No. 1103.

Results of physical, chemical, and microscopic tests on sheetings made entirely or in part from rayon staple and from cotton of known genetic origin are reported. In a preliminary investigation, 7 sheetings composed of all-cotton, all-rayon, or of different blends of these 2 fibers were evaluated in the laboratory and changes due to repeated launderings were determined. Based on the results of this investigation, sheets composed of all-cotton, all-rayon, and of a 50-50 blend of cotton and rayon were manufactured and placed in service in domitories at the University of Tennessee and Kansas State College. The effect of actual use on the properties of the sheets was determined after specified intervals of laundering and wear. 7 references.

Shrinkage caused by various laundering procedures used on wool and wool-blended fabrics.

R. L. Galbraith, J. Austin, M. Holder and C. Tate (University of Tennessee). *J. Home Econ. 47:* 339-342 (May, 1955).

A study was set up to determine the effectiveness of blending with hydrophobic fibers for increasing the dimensional stability of wool fabrics. It was decided to investigate the effect of temperature, type of detergent, and time of agitation on the shrinkage of both wool and wool-blended fabrics. It was found that the addition of dimensionally stable fibers to wool decreases substantially

the amount of fabric shrinkage. This decrease is greatest when the amount of synthetic fiber is as high as 55 per cent. Ten per cent of the synthetic fiber is not enough to give dimensional stability to the fabric. From the results of these and other experiments the directions for laundering wool should be revised to read as follows: Wash in water as hot as the hands can comfortably stand (about 120°F) containing any good detergent for as short a time as possible. 4 references.

Design in woven structure. Part 29. Undulating twill designs.

D. C. Snowden. *Wool Rev. 27:* 41 (April, 1955).

Double-plain suiting styles.

Wool Record 87: 800-803 (April 7, 1955).

Some constructions and color schemes.

Large open-work effects in tricot. Part 4.

J. Rab. *Knitter 19:* 81-84 (April, 1955).

Pick-and-pick developments.

Wool Record 87: 858, 867 (April 14, 1955).

A scheme for pattern and style development in woolens and worsteds is the arrangement of two colors one-and-one in both warp and weft.

Rayon crepes. Part 4. Experimental fabrics.

D. C. Snowden and G. Hinchliffe. *Brit. Rayon and Silk J. 31:* 52-56 (April, 1955).

Experimental crepe fabric constructions are described in notes on the appearance and characteristic effects of 22 different weaves. 22 print paper designs and 22 enlarged photographs of fabrics.

A comparison of selected upholstery fabrics for use on dining room chairs.

A. Collins. Master's thesis, Michigan State College, East Lansing, Michigan, 1954.

The development of guides for use in predicting fabric behavior in wear and drycleaning.

J. M. Kinney. Master's thesis, Ohio State University, Columbus, Ohio, 1954.

The effect of perspiration and light on fabrics containing synthetic fibers.

S. Emeline. Master's thesis, University of Tennessee, Knoxville, Tennessee, 1954.

The effect of various sewing threads and variation in the number of machine stitches per inch on the seam stability of fabrics containing synthetic fibers.

K. Bernetta. Master's thesis, University of Tennessee, Knoxville, Tennessee, 1954.

The effects of exposure in the fade-ometer on the service qualities of Orlon, nylon, Dacron, and acetate fibers in curtain marquisettes.

H. Graber. Master's thesis, Kansas State College, Manhattan, Kansas, 1954.

The effects of perspiration on elastic webbing.

D. M. Momany. Master's thesis, Purdue University, LaFayette, Indiana, 1954.

Factors affecting the yellowing of nylon.

W. F. Koch. Master's thesis, University of Tennessee, Knoxville, Tennessee, 1954.

The laboratory performance of nine winter cotton fabrics in dry cleaning and in cleaning alternated with abrasion.

C. Zillgitt. Master's thesis, Cornell University, Ithaca, New York, 1954.

Some properties of two specific blouse fabrics as they affect serviceability and consumer acceptance.

M. E. Miller. Master's thesis, Pennsylvania State University, State College, Pennsylvania, 1954.

The serviceability of cotton, viscose, and vicara blended fabrics in sport shirts.

M. C. Rankin, Master's thesis, University of Tennessee, Knoxville, Tennessee, 1954.

The serviceability of various seam finishes on nylon fabrics.

B. Owens. Master's thesis, University of Tennessee, Knoxville, Tennessee, 1953.

A study of the serviceability of selected dress fabrics utilizing the newer synthetic blends.

C. M. Womble. Master's thesis, University of North Carolina, Greensboro, North Carolina, 1954.

A study of two resin finished and unfinished cotton fabrics.

B. L. Weiser. Master's thesis, University of Missouri, Columbia, Missouri, 1954.

A study of two resin finished cotton percales.

M. L. Leach. Master's thesis, University of Missouri, Columbia, Missouri, 1954.

The suitability of certain seam finishes on selected washable synthetic fabrics.

E. Magee. Master's thesis, Cornell University, Ithaca, New York, 1954.

The thermal behavior of multiple layers of fabrics.

M. A. Morris. Ph.D. dissertation, University of Minnesota, Minneapolis, Minnesota, 1954.

Water repellent cotton fabrics in children's play clothing.

N. Berg. Master's thesis, Colorado A & M College, Fort Collins, Colorado, 1954.

FINISHING AND CHEMICAL PROCESSING D

Automation in hosiery finishing.

Proctor & Schwartz. *Modern Textiles Mag. 36:* 53, 69 (May, 1955).

This new unit sets, scours, dyes and finishes women's nylons at the rate of 100 to 120 dozen pairs per hour. Diagram.

Causes of faults, stains and defects encountered in dyeing, printing and finishing. Their detection: practical means of avoiding and correcting them.

P. Colomb. *Teintex 19, No. 12:* 912-923 (1954); *in French.* Through *Brit. Cotton Ind. Research Assoc. 35:* 206 (1955).

In continuation of previous articles, the author discusses the defects resulting from faulty desizing. Some compositions for sizing viscose and acetate rayon warp yarns and for desizing fabrics whose warp has been sized with linseed oil are given, and the desizing treatment,desizing apparatus, and printing defects due to faulty drying are described.

Chemistry and physical chemistry of textile auxiliaries. Volume 1. (Chemie und physikalische Chemie der Textilhilfsmittel).

H. Frotscher. VEB Verlag Technik, Berlin, 1954. 188 pages. *In German.* Through *Brit. Cotton Ind. Research Assoc. 35:* 207 (1955).

The first part of this work has introductory sections on the structure and properties of the textile fibers, a long section on surface-active materials, and short individual sections on the different assistants used in dyeing, printing, washing, scouring and bleaching, mercerizing, and carbonizing. There is a bibliography with 260 references.

How chemicals improve textiles.

E. T. Ellenis. *Modern Textiles Mag. 36:* 37, 74-75 (May, 1955).

A general survey of trends in chemicals for textiles.

The principles governing the efficiency of a padding mangle.

H. Potter (Bleachers Association Ltd). *J. Soc. Dyers Colourists 71:* 20-26 (January, 1955).

A simple theoretical discussion shows how the take-up of liquor in a fabric after passing through a squeeze mangle depends upon the distance of closest approach of the bowl surfaces. The mathematical relationship between this distance, the physical characteristics of the mangle, and the compressional characteristics of the fabric is worked out for an ideal case. How the final take-up in any practical case might depend upon other important factors is also considered. 2 references.

Sources of flaws, spots, and losses as a result of dyeing, printing, and finishing.

P. Colomb. *Teintex 19:* 912-923 (1954); *in French.* Through *Chem. Abstracts 49:* 4994 (April 10, 1955).

Review.

Syton and its uses in the wool manufacturing industry.

S. Douglas, Jr. (Monsanto Chemical Corp.). *Fibre and Fabric 108:* 6-9 (April 30, 1955).

An address delivered before the Lowell Technological Institute.

CHEMICAL PROCESSES D 1

Surfactants used in textile applications.

C. Pacifico and S. Giers (American Alcolac Corp.). *J. Am. Oil Chemists Soc. 32:* 231-235 (April, 1955).

Statistics are given showing amounts and types of surfactants used in textile processing, the operations in which they are used, and the properties desired for each of these operations. Tables are presented for cotton processing, wool processing, and processing of synthetics.

New interest in acetylation.

Textile Merc. 132: 545-548 (April 1, 1955).

Special purpose acetate fibers and useful new finishes for cotton are discussed.

Continuous bleaching range for knit goods.

Proctor and Schwartz, Inc. *Am. Textile Reptr. 69:* 45-47 (April 14, 1955).

This new bleaching range for tubular knit goods maintains a constant weight of cloth per hour. Fluorescent dyeing is followed by peroxide saturation. Photograph and cross sectional diagram. The range was perfected using the combined facilities of the P. H. Hanes Knitting Company, E. I. du Pont de Nemours, Inc., and Proctor & Schwartz.

Peroxide bleaching of protein fibers.

F. Jordinson. *Cobbler 7:* 21-33 (1954-55).

Recent developments in the bleaching of textiles with sodium chlorite.

P. Mosse. *Teintex 19:* 811-838 (1954); *in French.* Through *Chem. Abstracts 49:* 4996 (April 10, 1955).

Review with 86 references.

Basic research into the mercerization of yarn.

Fibres 16: 137-141 (April, 1955).

A discussion of studies at the Southern Regional Research Laboratory of mercerization of cotton yarn in skeins. The construction of the apparatus and the techniques employed are described in detail. 4 references.

New single-end mercerization process improves yarn properties.

Textile Ind. 119: 105 (May, 1955).

Information in U. S. patents nos. 2 647 037, 2 686 955, and 2 688 863, granted to William F. Luther of Dixie Mercerizing Company, is summarized.

Modification of the physical properties of hard fibers through chemical treatment, plant trial.

G. Thomson, R. J. Coskren and C. G. Cook. Fabric Research Laboratories, Inc., Boston, Mass. March, 1954. 21 p. Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photocopy $4.00. PB 116 326.

The work described in the report is a continuation of that given in Technical Report Number 5 on this project. In the current work, preliminary laboratory investigations were first carried out with the objects of determining more precisely the necessary conditions of treatment, and extending the work to grades of Manila abaca other than J-1, before proceeding with a plant trial. Technical report no. 9.

Nitrile latices: a new concept in textile finishing.

N. H. Sherwood (B. F. Goodrich Development Co.). *Am. Dyestuff Reptr. 44:* P262-P264 (April 11, 1955).

When applied as a warp size or as a finishing size, nitrile latices provide permanent abrasion resistance coupled with a soft, pleasant hand. Because of affinity for fibers and high binding power, nitrile latices can be used to improve the wash fastness or crock resistance of certain classes of pigment dyes. When used to modify wrinkle-resistant finishes, nitrile latices serve to reduce or eliminate the undesirable loss of strength and abrasion resistance normally associated with these treatments.

Crease resistance of cotton. Parts 1 and 2.

D. Fornelli. *Tinctoria 51:* 359-364, 397-405 (1954); *in Italian.* Through *Chem. Abstracts 49:* 4996 (April 10, 1955).

A review with 54 references.

Stabilization of viscose rayon.

P. B. Stam (Dan River Mills). *Am. Dyestuff Reptr. 44:* P251-P252, P261 (April 11, 1955).

When acrolein, the simplest unsaturated aldehyde, first became commercially available, Dan River Mills experimented with this highly reactive substance to develop a textile finish for cellulosic fabrics. Acrolein was found to react with a mixture of formaldehyde and paraformaldehyde in the presence of soda ash as a catalyst and in the presence of small amounts of gums and starches for modification of the final product to give X-2, which is useful for the stabilization of viscose rayon and crease resistance of cotton. The paper concerns itself in the first half with a study of the possible structure of X-2 without the modifying gums and starches. The second half considers the use of X-2 as a nitrogen-free bridge for cross-linking cellulose. X-2 has the fundamental advantage over urea- and melamine-containing finishes that it cannot form chloroamines, which can cause tendering and odors. 3 references.

Man-made fibers and modern trends in wet processing: 1954 review. (Section 2).

Brit. Rayon and Silk J. 31: 57-62 (April, 1955).

Resin finishing processes. 47 references.

Resin-finishing and recent research.

B. C. M. Dorset. *Textile Mfr. 81:* 198-202 (April, 1955).

Excessive drying can promote the formation of a fishy odor, even if up to this stage the fabric has been correctly processed. Dicyandiamide can be added instead of urea to the resin-impregnating liquor since it is somewhat more efficient in preventing odor. Wherever possible the use of ammonia or ammonium salts should be avoided.

Resin finishing of native cellulose.

W. Rotta and R. Allscher. *Textil-Praxis 9, No. 12:* 1183-1186 (1954); *in German.* Through *Brit. Cotton Ind. Research Assoc. 35:* 214 (1955).

The finishing processes based on the use of resin precondensates or aldehydes cause losses in tensile strength in cellulose fabrics. Tests are de-

scribed to show that these losses do not necessarily indicate fiber damage. After removal of the resins with a suitable solvent (e.g. ethylene glycol), the almost unchanged initial state of the fabric is restored. The DP-values indicate that no depolymerization of the cellulose molecule has taken place, for example, as a result of hydrolytic degradation by the acid catalyst.

Three-dimensional colored styles on cotton produced with resins.

E. W. Lawrence and R. H. Phillips (Cranston Print Works Co.). *Am. Dyestuff Reptr. 44:* P253-P255 (April 11, 1955).

By inking the embossing cylinder, it is possible to produce colored effects in the valleys of the embossed fabric. The opposite effect can be obtained by coloring the surface of the embossed fabric after embossing. Formulations and processing problems are discussed. Many of the thermosetting resins commonly used in cotton finishing also resist the shrinking action of caustic soda. It is then possible by adding pigments to a resin printing mixture to obtain a colored 3-dimensional effect by passing the fabric after printing and curing through a caustic soda bath, where only the unprinted portion of the fabric shrinks. By careful selection of the design and controlling the depth of printing, it is possible to obtain raised colored prints. Some of the details of this type of processing are discussed.

Improvement of the adhesion of glass textiles intended for the manufacture of articles coated with vinyl resins.

C. J. H. Pinte, P. Rochas and M. Coupez. *Bull. Inst. Textile France No. 49:* 7-32 (October, 1954); *in French.* Summary in *Brit. Cotton Ind. Research Assoc. 35:* 215 (1955).

Progress of silicones in the textile industry.

F. L. Dennett (Dow Corning Corp.). *Am. Dyestuff Reptr. 44:* P293-P295 (April 25, 1955).

In the relatively short period of five years, the use of silicones as textile finishes has grown from a small beginning on two or three fibers to substantial proportions on all fibers. This has been due in large measure to the development of stable emulsions that are readily diluted and applied to all fibers. Special mention has been made of a new upholstery finish as well as a finish especially designed to impart water repellency and spot resistance to wool. A brief summary of laboratory work and mill trials shows that the application of still another silicone emulsion formulation will effectively reduce the felting shrinkage of wool. 2 references.

DYEING AND PRINTING D 2

Basic mechanisms of dye absorption during pad-dyeing.

H. B. Mann (Courtaulds Ltd). *J. Soc. Dyers Colourists 71:* 7-12 (January, 1955).

A study of the basic mechanisms of dye absorption during pad-dyeing has shown that direct dyes are taken up by viscose rayon filament and staple fabrics in two ways (a) adsorbed at the surface of the individual filaments, and (b) in dye solution mechanically held within the fabric structure. A differential absorption of dye and water has been clearly demonstrated. This must always be present in principle, although it may become overshadowed by substantive dyeing of the fiber at high padding temperatures or after prolonged immersion in the dyebath. 5 references.

Continuous dyeing of wool rawstock in a scouring train.

DuPont Tech. Bull. 11: 37-41 (March, 1955).

A new technique developed by DuPont technicians which is of particular interest to the carpet industry.

Continuous ribbon dyeing.

L. J. Clarke. *J. Soc. Dyers Colourists 71:* 26-28 (January, 1955).

A method for the continuous dyeing of ribbon is described in which uniformity of shade over long runs is attained by introducing feed liquor into the dyebath through fine jets, thus maintaining turbulent conditions and uniformity of composition throughout the bath. 4 references.

Dye binding to high polymers.

G. Oster (Polytechnic Institute of Brooklyn). *J. Polymer Sci. 26:* 235-244 (April, 1955).

A number of examples are presented to show that cationic dyes bind to polymeric acids by simple electrostatic forces. Competitive binding for the substrate is illustrated by the addition of hydrogen ions, calcium ions, and streptomycin. Anionic binding to uncharged or to negatively charged substances is attributed to hydrogen bonding with the carbonyl groups of the substrate. Van der Waals' forces also play an important role in the binding. Illustrations are given for the substrates, native serum albumin, denatured ovalbumin, polyvinylpyrrolidone, and water-soluble urea-formaldehyde resin. In the last-named case the binding increases with increasing molecular weight of the substrate. A new fluorometric technique for following the binding of anions is described. The changes in spectral and photochemical properties which dyes undergo when bound are summarized. 47 references.

Dyeing and finishing sweater bodies of high bulk Orlon acrylic fiber.

DuPont Tech. Bull. 11: 11-12 (March, 1955).

Dyeing at high temperature.

A. Airoldi. *Tinctoria 51:* 366-376 (1954); *in Italian.* Through *Chem. Abstracts 49:* 4993 (April 10, 1955).

A review with 27 references.

Dyeing jute yarn. Part 1.

Dyer 113: 581-582 (April 15, 1955).

The application of acid, direct and basic dyestuffs in machines and some points on loading are discussed.

Dyeing of nylon carpet.

DuPont Tech. Bull. 11: 13-16 (March, 1955).

Dyeing of nylon with logwood.

O. Newsome. *Cobbler 7:* 5-11 (1954-55).

Excellent blacks of very good general fastness properties are obtainable. Logwood is now being applied commercially to nylon in the form of staple fiber, spun and continuous filament yarns in skein and package form, hosiery and woven piece goods.

Dyeing the modern synthetic fibers.

B. Kramrisch. *Cobbler 7:* 39-42 (1954-55).

A wide range of shades of adequate fastness have been obtained with modified processes. High-temperature methods are discussed.

Dyeing unions on Orlon acrylic fiber and Vicara.

DuPont Tech. Bull. 11: 21-24 (March, 1955).

DuPont dyes and formulas for the coloration of unions composed of 50/50 Orlon type 42 acrylic fiber and Vicara.

Felt dyeing and printing.

Dyer 113: 505-507 (April 1, 1955).

The machinery and dyestuffs used, achieving complete penetration, and a stencil-printing technique are discussed.

High-temperature dyeing.

J. P. Niederhauser. *Teintex 19:* 891-911 (1954); *in French.* Through *Chem. Abstracts 49:* 4994 (April 10, 1955).

A review with 74 references.

Historical notes on the wet-processing industry. Part 8. The secrets of the Reverende Maister Alexis of Piemount.

S. M. Edelstein (Dexter Chemical Corp.). *Am. Dyestuff Reptr. 44:* 247, 270-272 (April 11, 1955).

"Secrets" from a 16th century book of dyeing and cleaning formulas.

The improvement of luster of cotton. Part 11. Dyes and luster.

L. Fourt, H. J. Elliott and P. Streicher (Harris Research Laboratories, Inc.). *Textile Research J. 25:* 326-329 (April, 1955).

Luster tends to increase with depth of shade or increasing absorption of light, since this has greater effect on scattering from depth than on front surface reflection. Dyes which form particles on the surface or show more tendency to crock, such as the lake-forming dyes which are attached to cotton by mordants, show less increase in luster. Vat dyes which increase in crystallinity on soaping show a decrease in luster after soaping (even though the general appearance and quality is improved), indicating increased scattering by larger particles. 4 references.

Notes on dyeing tub-fast colors. Part 6.

F. O. Stone. *Knitter 19:* 84-85 (April, 1955).

Notes on naphthols helpful to technicians as well as non-technically trained dyeing and finishing plant operatives.

Problems in the dyeing of wool with chrome blacks.

G. H. Lister. *Cobbler 7:* 35-37 (1954-55).

Technical difficulties frequently arise in the dyeing of loose wool and slubbing with chrome colors. The author discusses the causes of these difficulties and suggests means by which they may be overcome.

A review of several methods of hydrosulfite analysis with special regard to control of vat dyebaths.

A. Airoldi and F. Marchi. *Am. Dyestuff Reptr. 44:* 283-288 (April 25, 1955).

This article appeared originally in Italian in *Tinctoria 51, No. 2:* 43-49 (1955).

Stripping dyes from wool.

D. Frishman and M. Harris. *Cobbler 7:* 45-47 (1954-55).

The presence of a cross-linking agent modifies fiber damage.

A study of carriers in dyeing Dacron polyester fiber.

C. L. Zimmerman, J. M. Mecco and A. J. Carlino (American Cyanamid Co.). *Am. Dyestuff Reptr. 44:* P296-P302 (April 25, 1955).

A study has been made of various types of carriers and their effectiveness in promoting the dyeing of Dacron polyester fiber. The rate and the extent of exhaustion of several disperse (acetate-type) dyes in the presence of the various emulsified carriers are shown. The relative diffusion rates of these dyes are also depicted, and the importance of diffusion rate is discussed. The best carriers found in this study from the viewpoint of both cost and efficiency were methyl benzoate and methyl salicylate, which increase the rate of diffusion of disperse dyes in Dacron to such a degree that this fiber can now be dyed below the boil on any type of equipment. 10 references.

Sweater shades on Acrilan acrylic fiber.

DuPont Tech. Bull. 11: 17-20 (March, 1955).

Theories of dyeing. Part 1. Dyeing processes at completion.

H. A. Turner. *J. Soc. Dyers Colourists 71:* 29-46 (January, 1955).

Part 1 of a series of papers to be published by the *Journal of the Society of Dyers and Colourists* which will summarize, as simply as is possible, scientific advances which are of interest to practical dyers. The author discusses in detail the problem of the difficulty of understanding theoretical papers, and then gives a general account of dyeing theory.

Trends in dye research.

W. Bradley. *Ind. Chemist 31:* 3-8 (1955). Through *Chem. Abstracts 49:* 4993 (April 10, 1955).

The Astrasol process for the preparation of film screens.

A. Franken. *Textil-Rundschau 9, No. 12:* 639-643 (1954); *in German.* Summary in *Brit. Cotton Ind. Research Assoc. 35:* 213 (1955).

Half-tone, idento- and raster techniques in screen printing.

A. Franken and W. Keller. *Melliand Textilber. 35, No. 11:* 1258-1259; *No. 12:* 1360-1362 (1954); *in German.* Summary in *Brit. Cotton Ind. Research Assoc. 35:* 213 (1955).

Printing and related operations on glass decorative fabrics.

R. F. Caroselli (Owens-Corning Fiberglas Corp.). *Am. Dyestuff Reptr. 44:* P303-P304 (April 25, 1955).

As printing glass is very different from printing organic fibers, new techniques must be followed. Glass fabrics must first be coronized at a temperature of 1200° F and then be given a protective coating of polyacrylate-latex, containing dispersed Teflon, to receive the print pattern. Oil-in-water or water-in-oil pigment-resin pastes may be used for printing. A curing and the application of a fixative finish to give wash fastness complete the process.

Printing fabrics of Orlon type 42 acrylic fiber.

DuPont Tech. Bull. 11: 28-32 (March, 1955).

Preparation for printing and printing dyes and procedures.

Printing with metal complex dyes on animal and synthetic fibers.

G. Bernardy and B. Hantsch. *Textil-Praxis 9, No. 12:* 1171-1175 (1954); *in German.* Through *Brit. Cotton Ind. Research Assoc. 35:* 213 (1955).

The chemistry of metal complex dyes and their affinity for fibers containing basic groups are briefly discussed, and the uses and methods of application of Palatine Fast, Vialon Fast, Neopalatine and Ortolan dyes in direct printing and discharge grounds on wool, silk, and polyamide fibers are described. Except for some of the Vialon Fast dyes, they are not suitable for printing polyacrylonitrile and polyester fibers.

Screen-printing mosaic.

A. Franken. *Tex 13, No. 12:* 1500-1504 (1954); *in Dutch.* Through *Brit. Cotton Ind. Research Assoc. 35:* 213 (1955).

In this review of new developments in screen-printing machinery, reference is made to the German invention of an automatic circular printing machine for printing socks, stockings, etc., in a continuous process.

Staining of Mylar polyester film and effect of cross-dyeing.

DuPont Tech. Bull. 11: 25-27 (March, 1955).

Five-gram skeins of different fibers, each containing a loop of Mylar, were dyed with recommended dyes by prescribed methods to determine the staining of Mylar.

The use of cellulosic and resinous binding agents in pigment printing.

P. Hoton. *Rayonne et Fibres Synthet. 10, No. 12:* 47-52 (1954); *in French.* Through *Brit. Cotton Ind. Research Assoc. 35:* 212 (1955).

In this review, the author discusses the use of cellulosic compounds (Sericose LC extra), synthetic resins, alginic acid and alginates, Velan PF (a mixture of stearamidomethylpyridinium chloride and sodium chloride), water-in-oil and oil-in-water emulsions, etc., and refers to some patented processes for the fixation of pigments (Bayer, Courtauld, IG-Farben, du Pont, Sherwin-Williams Co., Ciba, etc.).

The use of pigment dyes in printing.

P. Hoton. *Reyon, Zellwolle u. Chemiefasern No. 3:* 163-165; *No. 4:* 205-207 (1954); *in German.* Summary in in *Brit. Cotton Ind. Research Assoc. 35:* 212 (1955).

MECHANICAL PROCESSES D 3

A mechanical aid for the promotion of chemical processes in the textile finishing industry.

J. Hausermann and E. Hablutzel. *Textil-Rundschau 9, No. 12:* 621-628 (1954); *in German.* Through *Brit. Cotton Ind. Research Assoc. 35:* 216 (1955).

Experiments carried out with a model jig by using a vibration-generating mechanism (turbinator) are reported, in which the results obtained on treated and untreated samples are compared to show that many textile processes (dyeing, washing, removal of residual alkali from cotton fabric) can be accelerated and improved by intensive agitation of the material treated. The theoretical principles of turbination and uses of the turbinator (developed by the Maschinenfabrik Benninger AG., Switzerland) are discussed.

The natural thistle as raising agent in the industry.

P. Hoff. *Z. ges. Textil-Ind. 57, No. 1:* 56-62 (1955); *in German.* Through *Brit. Cotton Ind. Research Assoc. 35:* 216 (1955).

The use and advantages of fuller's teasel in finishing woolen cloth as compared with metal teasels are discussed.

New system of raising control.

Tomlinsons (Rochdale) Ltd. *Textile Recorder 72:* 84 (April, 1955).

The Auto-Zero Raising Device by the use of which it is possible to determine the point in the raising cycle where no action takes place on the cloth.

DRYING D 4

Conversion unit for existing stenters.

Tomlinsons (Rochdale) Ltd. *Textile Recorder 72:* 85 (April, 1955).

Designed to convert stenters from the parallel flow to the impact flow type. Diagram.

Problems of rapid drying.

F. W. Thomas (Brit. Cotton Ind. Research Assoc.). *Textile Wkly. 55:* 1030-1034 (April 8, 1955).

The finisher has had three considerations to meet: more rapid drying, more efficient drying, and the maintenance of a high quality standard. The purpose of this paper is to outline some of the ways in which difficulties are being met.

TESTING AND MEASUREMENT E

Applications of the reflecting microscope.

E. M. F. Roe. *Research 8:* 147-157 (April, 1955).

The author shows how the particular properties of reflecting microscopes lead to their application in the ultraviolet and infra-red regions and discusses some of the applications to microspectroscopy in these spectral regions. 55 references.

Conducting mill investigations in the wool industry.

A. Brearley. *Textile Mfr. 81:* 187-188, 191 (April, 1955).

The methods outlined in this article have been evolved after considerable experience of mill experimentation by Wool Industries Research Association staff. 8 references.

Determination of Ardil in Ardil-wool mixtures.

M. V. Glynn (Gordon Institute of Technology). *(Letter to the editor). J. Textile Inst. 46:* T228-T230 (March, 1955).

Fatigue tests on fibers, yarns and fabrics. Part 2.

W. Wegener. *Textil-Praxis 9, No. 12:* 1115-1122 (1954); *in German.* Through *Brit. Cotton Ind. Research Assoc. 35:* 218 (1955).

Devices for testing fatigue in fibers, yarns and fabrics on the principle of (a) stretching them to a predetermined degree and determining the elongation as a function of time, and (b) maintaining the elongation constant for a certain period and measuring the decrease in tension as a function of time, are reviewed and results are given in the form of three-dimensional phase diagrams. 24 references.

How much testing should a mill do?

N. L. Enrick. Charlottesville, Virginia: Institute of Textile Technology, 1955. 19 p. ITT Report no. 7.

The elements of processing variations, sampling error and sampling risk are combined in a formula for proper amount of testing for weight control, ends-down, loom stops and related actual applications. Complete examples are given for a carded yarn and a combed yarn mill. Ready-made sampling tables eliminate the need for calculations.

Simple microscopical testing methods.

H. Klenk. *Textil-Praxis 9, No. 12:* 1122-1126 (1954); *in German.* Through *Brit. Cotton Ind. Research Assoc. 35:* 221 (1955).

Various techniques for the preparation of fibers and yarns for microscopical examination are reviewed and photomicrographs of the fibers in different embedding media are given. A selection of German literature referring to textile microscopy is appended.

FIBERS E 1

Comparative solubilities of natural and man-made fibers.

S. S. Praeger (Division of Bedding Laboratory, New York State Department of Labor). *Am. Dyestuff Reptr. 44:* 281-282 (April 25, 1955).

The author describes a workable basis for the detection and analysis of complicated mixtures of fibers. Solubilities of natural and man-made fibers in various solvents are determined and tabulated so that the proper solvents can be selected in analyzing particular samples. 8 references.

Differential dyeing as an indicator of bilateral structure in wool: new findings.

J. H. Dusenbury and A. B. Coe (Textile Research Institute). *(Letter to the editor). Textile Research J. 25:* 354-358 (April, 1955). 10 references.

I. W. T. O. method for the determination of the ether-soluble extract of wool tops.

International Wool Textile Organization. *J. Textile Inst. 46:* S45-S46 (March, 1955).

Looking at fibers with electrons.

J. W. S. Hearle. *Skinner's Silk and Rayon Record 29:* 361-367 (April, 1955).

The use of the electron microscope for the study of fiber structure by transmission of electrons and by the reflection technique is explained. 15 photomicrographs. 5 diagrams show how the electron microscope works.

Measurement of the drag of cotton fibers.

H. A. Mereness (Institute of Textile Technology). *Textile Research J. 25:* 363-372 (April, 1955).

The drag of cotton fibers has been determined in card-sliver form, using the card-sliver stress-envelope method, and as a sliver made by hand carding using the hand-sliver IP method. In general, for the 12 cottons studied, there was a significant correlation between fiber drag data obtained using both methods and skein-strength data obtained from yarns made from these cottons. There were, however, a few notable exceptions. Fiber drag data was found to correlate poorly with inter-fiber friction data obtained using the Hood Tester, a dynamic method. The procedures used for evaluating the various cotton fiber drag methods are described in detail. 9 references.

Observations on the determination of xylan in jute.

W. G. Macmillan, A. B. Sen Gupta and A. S. Dutt (Indian Jute Mills Association Research Institute). *J. Textile Inst. 46:* T214-T224 (March, 1955).

Determination of the pentosan constituent of a plant material, which, in jute, is generally understood to be composed mainly of xylan, is based on the yield of furfural obtained on distilling the material with hydrochloric acid. In this paper the volumetric method of Kullgren and Tyden for the estimation of furfural has been modified, without using a catalyst, in order to make it more suitable for chemically treated jute. 20 references.

On the estimation of the degree of damage of wool fibers by means of the alkali swelling treatment.

I. Tsujimoto (Fukui University). *J. Textile Machinery Soc. Japan 1:* 60-61 (March, 1955).

A qualitative analysis of the textile fibers.

M. M. Lundegard. Master's thesis, Purdue University, LaFayette, Indiana, 1953.

The rigidity of filaments and fibers.

H. L. Roder. *Bull. Inst. Textile France No. 49:* 61-77 (October, 1954), *in French.* Through *Brit. Cotton Ind. Research Assoc. 35:* 218 (1955).

A description is given of methods for measuring the flexural rigidity (resistance to bending), torsional rigidity (resistance to small twisting forces), and the twisting angle at break (resistance to high twisting forces). The results are tabulated, showing the effects of various factors on flexural and torsional rigidity of man-made fibers.

Simple method of measuring the moisture content in fibrous materials.

M. Suzuki (Keio University). *J. Textile Machinery Soc. Japan 1:* 57-59 (March, 1955).

A simple infra-red moisture measuring method is described.

Studies on the determination of the ether-soluble extract of wool carried out by the technical committee of the I. W. T. O.

M. Robinet. *J. Textile Inst. 46:* S47-S50 (March, 1955).

YARNS E 2

Examination of the reliability and usefulness of the Ingolstadt lap tester.

W. Wegener and J. Delventhal. *Z. ges. Textil-Ind. 57, No. 1:* 34-38 (1955); *in German.* Through *Brit. Cotton Ind. Research Assoc. 35:* 202 (1955).

Examination as regards (1) the importance of an accurate zero-point adjustment, (2) the effects of gauge position and electrode distance on the measured result, and (3) the accuracy (within a narrow error limit) of measurements in the case of count differences, showed that the Ingolstadt lap tester is relatively insensitive to faulty setting and registers count variations with sufficient accuracy. The tester is, however, very sensitive to humidity variations and, therefore, unsuitable for testing material of non-uniform humidity.

Determination of the irregularity of filament yarns.

J. Prins. *Enka Breda Rayon Rev. (English ed.) 9:* 32-40 (March, 1955).

Discusses basic aspects of the variance length curve in measuring yarn unevenness.

SY evenness tester.

J. Textile Machinery Soc. Japan 1: 69-70 (March, 1955).

This tester uses the principle of air-micrometers to highly magnify and record yarn, roving and sliver irregularities of cross-section. Advantages over present capacitance testers claimed are (1) freedom from moisture variations and (2) absence of shape-factor influence on electrical fields.

Yarn irregularity control in the AKU spun rayon yarn experimental mills.

J. Prins and W. H. Peters. *Enka Breda Rayon Rev. (English ed.) 9:* 11-16 (March, 1955).

Both short-term and long-term yarn uniformity were improved by use of a statistical tool known as "index of irregularity" or "degree of imperfection." This tool weighs the actual variation in each process against that expected theoretically from the statistical laws of the Poisson fiber distribution. Detailed procedures are shown, together with actual data, so that other mills can readily apply these techniques to their own problems.

The dynamic friction between cellulose acetate yarn and a cylindrical metal surface.

D. G. Lyne (Courtaulds Ltd.). *J. Textile Inst. 46:* P112-P122 (January, 1955).

Measurement of the dynamic friction between cellulose acetate yarn and a chromium plated cylinder, using the Buckle and Pollitt tester, is described. Trials determining the variation of friction with (a) initial tension, (b) radius of test surface, (c) yarn speed, (d) twist, (e) oil content and (f) oil viscosity have been carried out. The results of trials (a) and (b) have been fitted to an equation previously published by Howell. 6 references.

Optical measurement of yarn twist.

H. Cirr. *Melliand Textilber. 35, No. 12:* 1331-1332 (1954); *in German.* Through *Brit. Cotton Ind. Research Assoc. 35:* 222 (1955).

The testing method described is based on determining the number of twists per length unit from the angle of inclination of the twisted yarn. The method is sufficiently accurate ($\pm$ 1 per cent), and the measurement can be carried out even on short yarn fractions. Directions for the construction of the goniometer are given and a nomogram is presented for the calculation of twists per inch from the measured angle *a* and the yarn diameter *d* (mm) according to the equation: $n = 8.07/d \times \tan a$. The device described can only be used for measuring yarns with Z-twist, but can be correspondingly altered for yarns with S-twist.

Simplification of yarn numbering.

K. Hentschel (German Textile Standardization Committee). *ASTM Bull. No. 206:* 44-45 (May, 1955).

This article is of particular interest to those parts of the textile industry that produce or use yarns made of various fibers. The single universal number system for all yarns referred to in the article is intended to displace eventually the confusion of multiplicity of systems now used and is advocated by ASTM Committee D-13 on Textiles. A series of preferred yarn numbers would be recognized and other yarns would be produced only on special order. 3 references.

FABRICS E 3

Apparatus for treatment of cotton fabrics on a laboratory scale.

W. T. Schreiber and A. C. F. Mason (Southern Regional Research Laboratory). *Am. Dyestuff Reptr. 44:* 288 (April 25, 1955).

This apparatus has been found useful in laboratory scale experiments in which cotton fabrics were chemically treated by exposure to reacting liquids. Only a small volume of reagent is required to treat a fabric sample large enough for evaluation. Conditions of temperature and time of exposure can be controlled and uniform exposure of

all portions of the sample to the reagent can be accomplished.

Cloth shrinkage measuring device.

Karl Frank GmbH. *Textile Recorder 72:* 89 (April, 1955).

This testing apparatus designed to determine the changes in size of textile fabrics during shrinking processes is intended to be used particularly on woolen and worsted cloths.

How warm is your fabric?

Textile Ind. 119: 131, 135 (May, 1955).

A brief survey of fabric warmth testing.

An instrument for determining the tearing strength of fabrics.

P. W. Harrison (Brit. Cotton Ind. Research Assoc.). *(Letter to the editor). J. Textile Inst. 46:* T226-T228 (March, 1955).

Measurement of the frictional and fusional properties of textiles at high sliding velocities

V. Lavrakas (Lowell Technological Institute Research Foundation). *Bull. Lowell Technological Inst. Series 58, No. 3:* 3-15 (February, 1955).

An apparatus for the study of friction and fusion of parachute materials based upon the belt friction principle is described. The effectiveness of lubricants in the prevention of fusion on parachute fabrics at high speeds has been studied and evaluated by means of this apparatus. In addition, the frictional forces of rubbing parachute materials and the nature of the ideal parachute lubricant have also been investigated. 8 references.

Measuring the flexural rigidity of woven fabrics.

J. A. Kalkman. *Enka Breda Rayon Rev. (English ed.) 9:* 1-9 (March, 1955).

After considering the principles of measurement of fabric stiffness, the author describes two testing methods: the heart shaped loop method and the clamped strip method. After measuring 22 rayon fabrics with both methods, the author compares their advantages and disadvantages. 3 references.

A new abrasion tester.

J. P. Simon. *Industrie Textile:* 873 (December, 1954); *in French.* Through *Brit. Cotton Ind. Research Assoc. 35:* 223 (1955).

The new abrasion tester Stat is described, by means of which it is possible to carry out ten experiments simultaneously on the same fabric under the same atmospheric and tensile-stress conditions, but at different pressure and with different abrading elements. The action of the tester approaches as closely as possible the practical wear conditions.

Research on the crease resistance of cloth. Part 1. Condition of measuring the crease resistance of cloth. Part 2. Analysis of the process of crease recovery.

S. Okajima and S. Ikeda. *J. Soc. Textile Cellulose Ind. Japan 10, No. 11:* 564-570; 570-573 (1954); *in Japanese (English summary).* Through *Brit. Cotton Ind. Research Assoc. 35:* 223 (1955).

Studies of fabrics under two-dimensional stress.

T. Eeg-Olofsson. *Medd. Svenska Textilforskningsinst. No. 50:* 1-7 (1955); *in Swedish.*

A new method is suggested for studying the behavior of fabrics under simultaneous extensions in two mutually perpendicular directions. The method consists in stretching a cylindrically arranged sample in an axial direction. Under the assumption that the bending forces can be ignored, it is possible to find the stresses in any wanted point of the stretched cylinder by measuring r, $\frac{dr}{dx}$ and, from $\frac{dr}{dx}$, $\frac{d^2r}{dx^2}$. As the corresponding strains can be directly measured, the relationship between the stresses and the strains can be found. 8 references.

The surface friction of fabrics.

Y. Miura. *J. Soc. Textile Cellulose Ind. Japan 10, No. 11:* 558-563 (1954); *in Japanese (English summary).* Through *Brit. Cotton Ind. Research Assoc. 35:* 223 (1955).

Equations are given for calculating the relation between the surface friction of cotton fabrics and the normal pressure, taking into account the degree of slippage which increases with increasing twist of the yarn and density of the fabric in the direction of slip.

Method of test for the count of yarn removed from fabric, free from added matter.

J. Textile Inst. 46: S20-S21 (March, 1955).

Tentative textile standard No. 31, 1955.

Method of test for the weights of warp and weft, free from added matter, per unit area of cloth.

J. Textile Inst. 46: S22-S24 (March, 1955).

Tentative textile standard No. 32, 1955.

Method of test for twist in yarn removed from fabric.

J. Textile Inst. 46: S17-S19 (March, 1955).
Tentative textile standard No. 30, 1955.

Methods of test for crimp of yarn in cloth.

J. Textile Inst. 46: S13-S16 (March, 1955).
Tentative textile standard No. 29, 1955.

Methods of test for the threads per inch in woven fabric.

J. Textile Inst. 46: S6-S12 (March, 1955).
Tentative textile standard No. 28, 1955.

OTHER E 4

Desizing procedures in relation to enzyme evaluation.

H. C. Borghetty and J. T. Taylor (Rohm and Haas Co.). *Am. Dyestuff Reptr. 44:* P256-P261 (April 11, 1955).

Many enzymes do not possess sufficient heat stability over a long period of time, but those of bacterial derivation, when properly formulated, can be utilized at high temperatures to give outstanding solubilization of starch under the most modern stream-lined textile-processing conditions. The correct testing procedure for the evaluation of enzymes, therefore, becomes an extremely important consideration. A modified test method that is closely correlated to plant conditions is offered. Formulations for practical plant use are outlined.

New method for determination of foaming power.

J. P. Sisley and M. Loury (Institut des Corps Gras, Paris). *Soap and Chemical Specialties 31:* 44-46, 99 (April, 1955).

The authors propose the use of a machine of the "mixer" type. In addition to extreme simplicity of manipulation, a high degree of reproducibility is possible. 3 references.

Studies on the method of measuring cotten dust content in the aïr by a small cyclone separator.

T. Murakami and S. Fukunaga (Naniwa University). *J. Textile Machinery Soc. Japan 1:* 42-47 (March, 1955).

INDUSTRIAL ENGINEERING F

Automatic control. Part 3.

C. G. Booy. *Enka Breda Rayon Rev. (English ed.) 9:* 17-22 (March, 1955).

This series of papers on automatic control is concluded with a general discussion of various procedures and of the manner of determining the choice of method of control and the position of the measuring point. The reasons for automatic control are also discussed. 13 references.

Production engineering research on yarn winding.

B. Hellern (Research Institute of Production Engineering, Oslo). *Textile Mfr. 81:* 197, 206 (April, 1955).

Studies were made in four cotton mills regarding layout, type of machines, methods of transport to and from the machines, followed by detailed time studies of the operators' direct productive times.

How many machines per operator?

D. H. Denholm. *Factory Management and Maintenance 112, No. 7:* 107-109 (1954). Through *Brit. Cotton Ind. Research Assoc. 35:* 153 (1955).

This article describes four steps that were taken by an American firm to solve the problem of increasing the number of machines per operative. As a result of the scheme, the number was increased from five to ten. A chart is given which enables machine interference to be quickly determined without the use of formulae.

New techniques of statistical decision making

Acme Reptr. No. 1: 1-4 (January, 1955).

A brief review of the important aspects of statistical decision making in operations research, linear programming and management in general. Stresses the limitations and the need to guard against them.

Operations research for management

J. F. McCloskey and F. N. Trefethen. Baltimore: The Johns Hopkins Press, 1954. 409p. $7.50.

The following types of tools of operations research are furnished: selected statistical applications, queueing optimization, information transfer, linear programming, symbolic logic, optimization and suboptimization, and game theory. A large section on general background is included and a final section on case histories from various commercial, military and social science applications. A thorough grounding in advanced mathematics is required for a full understanding of the tools of operations research presented in this book.

Application of operations research to industry.

E. A. Johnson. John Hopkins University.

Operations Research Office, Chevy Chase, Md. Jan. 1955. 62 p. Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.75. PB 111 596.

A speech delivered at the fifth annual Industrial Engineering Institute, University of California, January 31 and February 3, 1953.

MACHINERY AND MAINTENANCE F 1

Application of electrical equipment to textile machinery. Part 1. Motors and their enclosures

F. W. Cox. *Texture 2:* 17-20 (March, 1955).

Design and selection of industrial rolls

D. A. Kuniholm and V. J. Liberty (Rodney Hunt Machine Co.). *Design News 10:* 45-48 (April 1, 1955).

Design factors such as roll body and shaft deflection, performance characteristics of roll materials, loading, bending and torsion, and other stresses are considered.

The textile engineer: a review of machinery developments during 1954

Textile Merc. (Supplement) 132: 50-56,105 (March, 1955).

Experimental studies on pneumatic clearer.

I. Watanabe. *J. Textile Machinery Soc. Japan 1:* 63 (March, 1955).

The author has attempted to obtain simple relations theoretically. He has disregarded the pipe friction of the main pipe, but has given consideration to the coefficient of discharge through each hole.

Improvements in jute machinery design.

A. S. Gillies. *Fibres 16:* 127-133 (April, 1955).

A survey of the developments in jute processing machinery from opening through weaving of the past twenty-five years. Diagrams. Photographs.

WASTE DISPOSAL F 2

Flue gas treatment: a solution to highly alkaline dye wastes.

J. C. King (Fairforest Co.). *Textile Bull. 81:* 92-94 (April, 1955).

Using boiler flue gas to reduce excess alkalinity to permissible levels in finishing plant effluent.

QUALITY CONTROL F 3

Modern mill controls. Part 4. Preventive maintenance control of machinery.

N. L. Enrick. *Modern Textiles Mag. 36:* 45, 48, 76 (May, 1955).

Describes a modern control system, including control records, replacement procedure, work reports, maintenance frequencies, and maintenance of laboratory equipment. Examples and illustrative flow charts are included. Advantages sought are increased production, better quality, and decreased breakdown and repair costs, as a result of a preventive routine maintenance program, properly planned for the mill as a whole.

Statistical quality control in a filament weaving plant.

E. R. Bechner. *Textile World 105:* 131-133, 202-204 (May, 1955).

Discusses "where to begin," "five steps to control," and specific types of areas where results can be achieved. The treatment presupposes a good prior knowledge of statistical quality control methodology.

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SCIENCES G

CHEMISTRY G 1

The influence of electrode potentials on the extent of reduction of cystine in hair fibers by reducing agents.

H. E. Jass and L. S. Fosdick (Northwestern University). *Textile Research J. 25:* 343-353 (April, 1955).

The effect of reducing agents on hair fibers was measured by studying the relaxation curves of fibers kept at constant elongation in a solution of the reagent. Where reduction occurred, the extent of reduction, as measured by the final equilibrium stress level, was dependent on the electrode potential of the reagent. The reduction of stress corresponded to reduction of cystine disulfide linkages within the fiber as shown by chemical analyses of treated hair fibers. The dependence of the amount of reduction on the reagent potential indicates that the cystine residues within the keratin fiber exhibit dissimilar E° values. 11 references.

Reaction of cotton with B-propiolactone in the presence of alkali.

G. C. Daul, R. M. Reinhardt and J. D. Reid (Southern Regional Research Laboratory). *Textile Research J. 25:* 330-333 (April, 1955).

The reaction of cotton cellulose with β-propiolactone may be effected in the presence of strong alkalies such as sodium hydroxide and potassium hydroxide. Monoethanolamine and trimetheylbenzyl ammonium hydroxide will also catalyze the reaction, but to a lesser degree. Di- and triethanolamine are ineffective. Byproducts of the reaction are water soluble and may be removed with a hot-water wash. Conditions of the reaction such as time, temperature, concentration of reagents, and effect of diluents were investigated and are reported. The products are mixed ethers and esters of cellulose and polyesters thereof, in fibrous form. The ether linkages are stable to saponification, while the ester linkages are broken. Therefore, saponification, removes all but the carboxyethyl groups attached directly to the cellulose molecule. 5 references.

The suppression of soil redeposition.

J. Ross and P. T. Vitale (Colgate-Palmolive Co.) and A. M. Schwartz (Harris Research Laboratories Inc.). *J. Am. Oil Chemists Soc. 32:* 200-204 (April, 1955).

Soil redeposition is caused primarily by presence of calcium and magnesium cations found in natural waters and to a lesser degree by the relatively high concentration of sodium ions introduced with the washing composition. In the present study the deposition effects from Aquadag suspensions are examined as quantitatively as possible in order to evaluate the suppression of the influence of mono- and divalent cations. Suppression of soil deposition by elimination of the cations responsible, or by protection of the soil and/or cloth substrate from the action of cations are considered. 6 references.

Distribution of the substituents in heterogeneously methylated celluloses

T. Abe, K. Matsuzaki, A. Hatano and H. Sobue (Tokyo University). *Textile Research J. 25:* 254-256 (March, 1955).

Four methyl celluloses made from cotton linters with dimethyl sulfate and alkali in toluene and one commercial product were hydrolyzed. Unsubstituted, monomethyl, dimethyl, and trimethyl glucose in the hydrolyzates were separated by filter paper chromatopile, and the results were compared with the calculated values of Spurlin and the experimental values of other investigators. 8 references.

The effect of the distribution of methoxyl groups upon some textile properties of methylated cotton fiber

R. E. Reeves, A. C. Armstrong, F. A. Blouin and L. W. Mazzeno, Jr. (Southern Regional Research Laboratory). *Textile Research J. 25:* 257-261 (March, 1955).

The distribution of substituents may be of primary importance in determining the textile properties of modified cottons. For retention of desirable textile properties and improvement of rot-resistant qualities, substitution in the range of 0.25 to 1.0 per glucose unit should preferably be carried out under minimum swelling conditions. Swelling conditions, of course, increase the rate of substitution reactions, but they may produce undesirable properties in the methylated product and reduce the effectiveness of the rot resistance. 7 references.

Entropy changes accompanying the stretching of cellulose fibers in water

G. M. Bryant and H. Wakeham (Textile Research Institute). *Textile Research J. 25:* 224-235 (March, 1955).

Thermodynamic equations for elasticity are used to relate the force-temperature behavior of cellulosic fibers in water to the entropy of stretching. Water-fiber interactions may have an appreciable influence on the observed behavior, but this cannot be decided without further experimental data on the swelling and sorption behavior of cellulose in water. 20 references.

A note on nonlinear viscoelasticity

L. Peters (Univ. of Leeds). *(Letter to the editor). Textile Research J. 25:* 262-265 (March, 1955).

A new approach to the theory of viscoelasticity of solids is developed.

Reactions at wet-dry interfaces on fibrous materials

R. Schaffer, W. D. Appel and F. H. Forziati. *J. Research Nat. Bur. Standards 54:* 103-106 (February, 1955).

The "brown-line" reaction on cellulosic materials at the boundary between areas wet with water and dry areas has now been found to be an example of a general phenomenon. Other fibers and liquids participate in oxidation reactions at wet-dry interfaces. Examples of the reactions are given, the conditions necessary for them are demonstrated, and the nature of the reactions is discussed. 4 references.

The reduction of the aldehyde groups in periodate oxycelluloses by sodium borohydride

F. S. H. Head. *Shirley Inst. Mem. 28:* 41-47 (January, 1955).

It is shown that treatment of periodate oxycelluloses with aqueous sodium borohydride greatly diminishes their reducing power (copper number) and their fluidity in cuprammonium. These results show that the aldehyde groups in the oxycelluloses are reduced by the borohydride, and that the reduction leads to the stabilization of linkages that were rendered alkali-sensitive by the presence of the aldehyde groups. The effects of varying the pH, the temperature, and the reagent concentration in the borohydride treatment have been investigated, and optimum conditions for the reduction are suggested. 15 references.

Silk fibroin as a fibrous protein

F. O. Howitt (Wool Industries Research Assoc.). *Textile Research J. 25:* 242-246 (March, 1955).

The chemistry and structure of silk fibroin are examined. 9 references.

The sorption of gases having acidic and basic properties on nylon fibers

L. E. Peterson (Univ. of Minnesota, Minneapolis). *Univ. Microfilms* (Ann Arbor, Mich.), *Publ.* No. 10,036, 67 pp. (microfilm, $1.00; paper enlargement, $6.70); *Dissertation Abstr. 14:* 1940 (1954).

PHYSICS G 2

Experimental study on the internal friction of tire cords.

K. Fujino, H. Kawai and T. Horino (Kyoto University). *J. Textile Machinery Soc. Japan 1:* 9-17 (March, 1955).

15 references.

Friction of nylon as a function of load and surface curvature.

M. W. Pascoe and D. Tabor (Univ. of Cambridge). *(Letter to the editor). Research 8:* S15-S17 (April, 1955).

10 references.

The frictional properties of nylon.

D. Summers-Smith (Imperial Chemical Industries Ltd). *(Letter to the editor). Research 8:* S17-S18 (April, 1955).

This note shows the influence of the surface condition on the coefficient of friction. Tests were made on three different types of surface: two of these were the original moulded surfaces, the mould temperature being 30°C and 110°C respectively; the third was a machined surface. 3 references.

Influence of liquid films on fiber friction.

G. King (Wool Industries Research Association). *(Letter to the editor). Nature 175:* 383 (February 26, 1955).

On generalized belt tension formulas.

K. Nakajima, K. Matsuoka and T. Inoue (Naniwa University). *J. Textile Machinery Soc. Japan 1:* 47-51 (March, 1955).

The authors have analyzed mathematically general cases where both yarn and cylinder move, with similar assumptions to those adopted for the derivation of the belt tension formula. The conventional Amonton's law of friction is used for its mathematical simplicity. In some cases the effect of centrifugal force is neglected. 5 references.

Air flow through plugs of textile fibers. Part 1. General flow relations.

E. Lord (Brit. Cotton Ind. Research Assoc.). *J. Textile Inst. 46:* T191-T213 (March, 1955).

The general problem of fluid flow through complex fiber structures has long had obvious application in textiles, particularly in connection with the permeability of fleeces and fabrics and with various aspects of dyeing and fluid absorption. In this paper, a study is made of the various factors governing the flow of air through plugs of textile fibers. The magnitude of the porosity

effect differs from that predicted by various hydrodynamical theories. The nature of the fiber surface is also found to affect the flow. An empirical relation between flow and the various plug characteristics is developed, but where specific fiber surface is to be predicted accurately from permeability measurements, the investigation indicates the need for empirical calibration of flow apparatus under conditions of use. 21 references.

The rate of flow of liquids into capillaries under the action of surface forces.

G. F. N. Calderwood and E. W. J. Mardles (Royal Aircraft Establishment). *J. Textile Inst. 46:* T161-T170 (March, 1955).

The rate of flow of liquids into and from capillaries or between surfaces is of some importance in problems of the wetting of textiles, soil mechanics, lubrication, viscometry and chromatography. In clean tubes it is usually assumed that the contact angle is zero and that any meniscus effect is absent. The purpose of this paper is to present experimental results indicating that a disturbing frictional effect, associated with the resistance of thin elastic films adjacent to, and forming an integral part of, the menisci, is present. 12 references.

Static electrification of filaments: Experimental techniques and results.

S. P. Hersh and D. J. Montgomery (Textile Research Institute). *Textile Research J. 25:* 279-295 (April, 1955).

An apparatus has been constructed to measure the sign and amount of electric charge generated when two substances are rubbed together. The investigation may be divided into two parts: (1) effects produced by the mechanics of rubbing, and (2) effects produced by the nature of the materials rubbed. 39 references.

Evaporation of water drops spreading from an atomizer.

T. Uematsu, T. Kano and M. Nagai (Osaka University). *J. Textile Machinery Soc. Japan 1:* 62 (March, 1955).

A mathematical treatment.

Antistatic action versus molecular structure

G. R. Ward (General Aniline and Film Corp.). *Am. Dyestuff Reptr. 44:* P220-P226 (March 28, 1955).

Some aspects of charge generation are discussed, especially as regards evaluation methods. Also, on this basis, the amount of conductivity needed for antistatic action in actual use is deduced. Bulk resistivities in the oxyethylated nonylphenol series are discussed. The antistatic efficiencies of oxyethylated materials are investigated, especially as regards storage. For antistatic action a certain amount of oxyethylation is necessary with low hygroscopicity materials, but not so much that complete solidification results. Increasing oxyethylation improves storability, but for good storability an adequate size or complexity of hydrocarbon portion is needed. 14 references.

Static electrification of fibrous materials

S. P. Hersh (Princeton Univ., Princeton, N. J.). *Univ. Microfilms* (Ann Arbor, Mich.), *Publ.* No. 9420, 154 pp. (microfilm, $1.93; enlargement, $15.40); *Dissertation Abstracts 14:* 1519-1520 (1954).

BIOLOGY G 3

Adsorption of available chlorine and quaternary ammonium compounds by cotton and wool fabrics from disinfecting solutions.

M. T. Goldsmith, M. A. Latief, J. L. Friedl and L. S. Stuart (Home Economics Research Branch, U. S. Agricultural Research Service). *Appl. Microbiol. 2:* 360-364 (1954). Through *Chem. Abstracts 49:* 5849 (April 25, 1955).

Cotton required 8-20 p.p.m. and wool 41-800 disinfect 3 g. of fabrics inoculated with *Escherichia coli* and *Micrococcus pyogenes var. aureus* 209P and treated in 100 ml. of the germicides. The wool reacted with the high concentrations of disinfected when 200-2000 p.p.m. of alkyldimethylbenzylammonium chloride (alkyl=8-18 C atoms) (I) was added; wool required 100-666 p.p.m. Cotton adsorbed 70-90% of the available Cl when 10-30 p.p.m. solutions were used, while wool adsorbed practically all of the Cl from solutions containing 800 p.p.m. In low concentrations of I, cotton fabric adsorbed as much as 75% of the chemical. Wool removed 25-75% of I from solutions with initial concentrations ranging from 10 to 100 mg./100 ml. Higher concentrations of germicides were required to disinfect fabrics contaminated with *M. pyogenes* than to disinfect those contaminated with *E. coli.*

Mildew-proofing treatments for sandbags.

J. M. Ashcroft. U. S. Army. Corps of Engineers. Research and Development Laboratories, Fort Belvoir, Va. Oct. 1951. 25 p. Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 111 574.

This report covers an investigation of the relative effectiveness of copper 8-quinolinolate, copper naphthenate, and partial acetylation, as mildew-resistant treatments for cotton sandbag material.

PATENT CHECKLIST

U. S. Patents may be obtained from the U. S. Patent Office, Washington 25, D. C., for 25 cents per copy. Photostatic copies of foreign patents are available. Charges for these photostats are based on the number of pages in the patent.

Col. 275

FIBERS A

Cutting devices for fiber flock

H. Ewing (to British Celanese Ltd). BP 716 983, October 20, 1954. Through *BCIRA 35:* 125 (1955).

NATURAL FIBERS A 1

Cotton bale with waterproof protective covering

O. Hartman. USP 2 705 557, April 5, 1955.

YARN PRODUCTION B

Process and apparatus for converting continuous filament into a sliver of combed, drafted and separated staple-length fibers.

R. C. Wilkie (to Pacific Mills). USP 2 706 834, April 26, 1955.

Process and apparatus for making fiber packages.

R. C. Wilkie (to Pacific Mills). USP 2 707 806, May 10, 1955.

DRAWING AND ROVING B 3

Spring weighting device for the drawing rolls in spinning and roving frames.

F. G. De Santis (to Whitin Machine Works). USP 2 707 807, May 10, 1955.

YARNS B 5

Process for producing glass strand-paper twine.

J. C. Pullman (to American Cyanamid Co.). USP 2 707 367-369, May 3, 1955.

Twine of sisal fibers and resin coated glass fiber strands.

G. Slayter (to Owens-Corning Fiberglas Corp.). USP 2 706 377, April 19, 1955).

Yarn tube wrapper.

W. F. Caraher (to E. I. du Pont de Nemours and Co.). USP 2 708 066, May 10, 1955.

Col. 276

FABRIC PRODUCTION C

WARPING, SLASHING, YARN PREPARATION C 1

Apparatus for warp leasing.

C. W. Cain and J. A. Yarbrough. USP 2 706 846, April 26, 1955.

WEAVING C 2

Control for loom letoff.

A. J. Herard, Jr. (to Crompton and Knowles Loom Works). USP 2 707 973, May 10, 1955.

Electrical weft pirn feeler for looms.

N. Brunner (to Soc. Anon. Adolphe Saurer, Switzerland). USP 2 707 976, May 10, 1955.

Hand looms.

S. Doniger. USP 2 707 316, May 3, 1955.

Harness frame for looms.

P. C. Consoletti (to Draper Corp.). USP 2 707 496, May 3, 1955.

Harness stop motion for automatic looms.

H. P. Bailey and T. E. Smith, Jr. USP 2 707 497, May 3, 1955.

Heddle bar support.

F. M. Suchke (to Pioneer Heddle and Reed Co., Inc.). USP 2 707 495, May 3, 1955.

Loom reed threading device.

M. J. Mackay (to Wisconsin Wire Works). USP 2 707 317, May 3, 1955.

Loom shuttle.

A. Villani (to Draper Corp.). USP 2 706 500, April 19, 1955.

Loom shuttle box with stop motion control.

F. S. Eves (to Munster Simms and Co. Ltd). USP 2 707 498, May 3, 1955.

Loom stop motion.

K. E. Sanderson (to Draper Corp.). USP 2 707 977, May 10, 1955.

Shuttle binder and mounting therefor.

S. O. Dodge (to H. F. Livermore Corp.). USP 2 707 974, May 10, 1955.

Shuttle threading block.

J. M. Tuten (to Draper Corp.). USP 2 707 975, May 10, 1955.

KNITTING C 3

Lubrication of knitting machines.

H. F. McDaniel, Sr. USP 2 707 872, May 10, 1955.

Method of making a highly stretchable laminated knitted fabric.

L. M. Plansoen and E. M. Seaman (to The Federal Leather Co.). USP 2 706 699, April 19, 1955.

Safety means for the pattern mechanism of knitting machines.

H. E. Haehnel (to Textile Machine Works). USP 2 707 873, May 10, 1955.

FABRICS C 4

Knitted elastic fabric.

I. Gross, J. R. Little, Jr. and R. Guillemette (to Fairhope Fabrics, Inc.). USP 2 706 898, April 26, 1955.

Pile fabric.

E. J. Cogovan (to Mohawk Carpet Mills, Inc.). USP 2 706 324, April 19, 1955.

Woven fabric prepared from synthetic twine.

J. C. Pullman (to American Cyanamid Co.). USP 2 707 499, May 3, 1955.

FINISHING AND CHEMICAL PROCESSING D

Apparatus comprising a thread-advancing reel for the treatment of filamentary material such as yarn.

J. A. Truitt (to American Viscose Corp.). USP 2 707 384, May 3, 1955.

Apparatus for applying fibrous flock to adhesively coated objects.

R. Hug (Switzerland). USP 2 706 963, April 26, 1955.

Method and apparatus for applying liquid materials to mineral fibers.

A. J. Pearson (to Owens-Corning Fiberglas Corp.). USP 2 707 690, May 3, 1955.

Method and apparatus for fluid treating yarn in a helical path.

R. W. Stanley and W. B. Lowe (to American Viscose Corp.). USP 2 707 668, May 3, 1955.

Process for reducing the pill propensity of a staple fiber fabric.

L. D. Swan (to E. I. du Pont de Nemours and Co.). USP 2 706 845, April 26, 1955.

CHEMICAL PROCESSES D 1

Method of treating a pile for use in a pile fabric with synthetic resin.

J. B. H. Van Issum (to Fabric Development Co. Ltd). USP 2 707 158, 160, April 26, 1955.

Process of coating cotton yarn.

G. L. Deniston (to Commonwealth Engineering Co.). USP 2 706 690, April 19, 1955.

Treatment of cellulosic material with guanamine resins.

J. K. Dixon and N. T. Woodberry (to American Cyanamid Co.). USP 2 706 718, April 19, 1955.

DYEING AND PRINTING D 2

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MECHANICAL PROCESSES D 3

Napping machine.

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TESTING AND MEASUREMENT E

FIBERS E 1

Strength and elongation fiber tester.

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